parts to a radio -
resistors - resists
capacitors - stores $\frac{1}{=}$ earth ground
inductors - strains

upside chicken foot

(3)

ionosphere - refracts signals back to earth (for around of world prop)
- max usable freq - prop

line of sight - vhf/uhf -
6 miles - horizon
repeater - range extender

---

freq. to Band conversion
a group of freq

~~300 ÷ freq mhz 28.3 m~~

300 | 147.735

147.75 | 300.0

---

measure
standing wave ratio meter

234 for 1/4 way

234 ÷ freq   8.26 feet
28.3 | 234.

300 ÷ freq

lower in freq

14 | 234

234 = 1/4 wave ÷ freq

468 = 1/2 wave

Antennas fed with feed line = coax
50-52 ohms)

Antennas

beam - sends - radiates one direct

vertical - all directions

dipole - 2 direct

kilo - to mega band - old receivers calibrated ~~in~~
in KHz - now dec 3 places

~~3250 khz~~ ~~3250~~ 3750 KHz = 3.750 mhz

Connected

mike - ~~transceiver~~ SWR bid - ant sw - 3 antenna

TNC - terminal node (network controller) - used to communicate with computer

JJ = VE

Lana

28.5

harmonics - multiples up 40 7.1 = 4th har
harmonics - RAZ 7/300 28.4

amateur license - renew every 10 years (5)
- in English
- transmit as short as poss.
- remote control - rc device - transmits TX.
  - fcc concerned about na, addr + call sign
  - affix to TX

broadcast - illegal in ama - radio - 1 way trans

allowable -
beacon -
remote control devices
emerg. info bulletins - health + welfare Trans
bulletin pert. to ham
- morse code practice

beacons send call sign - 24 hrs a day - tests prop ionosphere

tactical - first trans from an area affected by

drills - may be no more than once a week
  - no longer than one hour + must be conducted by a responsible org.

DCS - purchase of equip & class - tax deduct.

ionosphere - 3 layers

D - dense day

E - mid - max ionization

F - fair layer -

men ionize - just before dawn

HF = high freq.

D layer absorb - absorbs sig like sponge during day

VHF / UHF / expands tropospheric ducting

layers of warm air - hot air goes to troposphere - ducted to long range.

tropo - expands.

(7) (8)

rf - danger - heat

swr - directional watt meter - how many going & how many returning
- 96 - foward
- 94 reflected
2

80 foward - 70
10 reflect 100.

if power more than 10% reflected power

current - rated in amps - measure with amp meter - is connected in series (flows 1 way. To measure pressure on circuit - Volt meter - connected in parallell
- to measure resistans - ohm meter - also connected in ~~series~~ parallell
only 1 meter in series

120 V 47000 ohms
.00255
47000 | 120.00

only one guest with math - always same one

capacators store energy in farads
milli- micro farads 10-6 millionth
trillio pico farads 10-12 trillionth

air core inductors used in radio
because they have low circuit losses

Least of all receivers - detector - detects
the kind of signal - SSB = SSB
FM = FM detecta

~~detect~~.

Modes of transmission
F3E = FM = vary frequency
J3 - ~~Sideband~~
CW - switching TX carrier off & on - morse code
AM - accomplished by varying strength - amplitude

Open parallell line ~~feed~~ line that was
~~used~~ can be opr at high standing wave
will interfer with everything (not twin lead)

beam - one direct
also quad - two or more parallell
loops each 1 elec wave length
long

2 types of coax fed line - one side grounded
- unbalanced
- both sides ~~are~~ not grounded - balanced

Power - measured at crest or peak (9)
of modulation - peak envelope power

offset
70cm - 440
5 mhz

440
70cm - 5 meg mhz
1.25 mtr
220 cm 1.6 mhz

2m - .6 mhz

P.L. secret tone - or to operate repeater
in close proximity

① 8/4/91

code practice

lesit t t
tle this
it thisis it

Lamar AB6DB

Fred Terry KI6TY

JJ K56HW

e e e e e
.. I I I i i i i
... ssis s s s
is
.... h h h hh
he hi's she
— t
— — m m m m me miss
mist
— — — o o o oh ohio
edsomt
— . n n no not nine n
. — a a a
at ~~ait~~ ate
name
Train
a a o s i h n a a s o ~~mt~~
hsie
omt na
.. dits — numbers
.

for counts number

i. d d d
do date
data
... i u w
use unit
united

e i s h t m o n a d u
5 0 1 9 2 8 3 7 4 6
know enough for code test
period counts as 2 hand
The train is not at the
station.

The name is tomandi@mintem
n e s s e e.
test will be one of these two sistens.
will not violate integrity of by tells
Which sentence
It was the anything we have it received today
how will test
charlie will give code test

the name is Tom and i am
in tennessee.

When Tom asked if there were 3 pkgs of exams, Sandy got an envelope & started to open it. Tom told her to give it to one of the VE's (Bob). Bot. When I couldn't find one of the diagrams Tom asked Sandy about it and Sandy said it was in one of the pkg's. She went & got it. Mike handed it to me.

Sandy came by to be sure I had entered series test on top, & noticed & mentioned that I had a

different test from everyone else (out loud).

During my tech 400 exam, Mike said - "where's Tom."

Sandy "I don't know"

About 10" later Tom came down from upper level. 4:10

Bob ~~requested~~ was only VE checking exams.

after my novice was graded

they gave it to
Bob back. (missed 2)
When ~~Bob~~ finished
grading my Tech
(upstairs) Sandy
brought the test
back (I missed 2).
Only those intending
to take code in
next 6 to weeks
could get certificate.
Had to be done in
red so they couldn't
be forged.

For the young boy,
James, Sandy
graded the novice. He
failed (he missed
3 more than

allowed) Sandy
was in the process
of reading James
questions for his
second test when
I left. At the
beginning of the
exam session
Sandy said "We'd
better check 1 & 2's.
A drivers license
will be good. We
need to see a picture."
I got my D.L. out.
Sandy verified & told
James it was ok.
All the VE's arrived
without anything
in hand. Just pkg
already there.

ATTACHMENT 1 ←

W5YI, P.O. Box #565101, Dallas, Texas, 75356 - Tel. (817)461-6443 Published February, 1991

The Radio Amateur's

ELEMENT 2

Novice Class Test Manual

Contains all questions & answers in the Novice Class VEC Question Pool

Updated for the new Codeless Technician rules

All Volunteer Examiners (VE's) and Volunteer Examiner Coordinator (VEC) organizations are required to use these Novice Class questions verbatim in preparing their Element 2 examinations. These test questions were released into the public domain by the VEC organizations' Question Pool Committee on July 1, 1990. The purpose of this test manual is to alert the public to the content of the Element 2 question pool. Element 2 is common to both the older Novice testing program and the newer VE/VEC System since passing the Novice level is a requirement for the Technician Class.

Contents:

SUBELEMENT 2A - Rules and Regulations (10 Questions)

One (1) question should be from the following:

1. What are the five principles that express the fundamental purpose for which the amateur service rules are designed? [2A-1.1]
   A. Recognition of emergency communications, advancement of the radio art, improvement of communication and technical skills, increase in the number of trained radio operators and electronics experts, and the enhancement of international goodwill
   B. Recognition of business communications, advancement of the radio art, improvement of communication and business skills, increase in the number of trained radio operators and electronics experts, and the enhancement of international goodwill
   C. Recognition of emergency communications, preservation of the earliest radio techniques, improvement of communication and technical skills, maintain a pool of people familiar with early tube-type equipment, and the enhancement of international goodwill
   D. Recognition of emergency communications, advancement of the radio art, improvement of communication and technical skills, increase in the number of trained radio operators and electronics experts, and the enhancement of a sense of patriotism

2. Which of the following is not one of the basic principles for which the amateur service rules are designed? [2A-1.2]
   A. Providing emergency communications
   B. Improvement of communication and technical skills
   C. Advancement of the radio art
   D. Enhancement of a sense of patriotism and nationalism

3. The amateur service rules were designed to provide a radio communications service that meets five fundamental purposes. Which of the following is not one of those principles? [2A-1.3]
   A. Improvement of communication and technical skills
   B. Enhancement of international goodwill
   C. Increase the number of trained radio operators and electronics experts
   D. Preserving the history of radio communications

4. The amateur service rules were designed to provide a radio communications service that meets five fundamental purposes. What are those principles? [2A-1.4]
   A. Recognition of business communications, advancement of the radio art, improvement of communication and business skills, increase in the number of trained radio operators and electronics experts, and the enhancement of international goodwill
   B. Recognition of emergency communications, advancement of the radio art, improvement of communication and technical skills, increase in the number of trained radio operators and electronics experts, and the enhancement of international goodwill
   C. Recognition of emergency communications, preservation of the earliest radio techniques, improvement of communication and technical skills, maintain a pool of people familiar with early tube-type equipment, and the enhancement of international goodwill
   D. Recognition of emergency communications, advancement of the radio art, improvement of communication and technical skills, increase in the number of trained radio operators and electronics experts, and the enhancement of a sense of patriotism

5. What is the definition of the amateur service? [2A-2.1]
   A. A private radio service used for personal gain and public benefit
   B. A public radio service used for public service communications
   C. A radio communication service for the purpose of self-training, intercommunication and technical investigations
   D. A private radio service intended for the furtherance of commercial radio interests

6. What name is given to the radio communication service that is designed for self-training, intercommunication, and technical investigation? [2A-2.2]
   A. The amateur service
   B. The Citizen's Radio Service
   C. The Experimenter's Radio Service
   D. The Maritime Radio Service

7. What document contains the specific rules and regulations governing the amateur service in the United States? [2A-3.1]
A. Part 97 of title 47 CFR (Code of Federal Regulations)
B. The Communications Act of 1934 (as amended)
C. The Radio Amateur's Handbook
D. The minutes of the International Telecommunication Union meetings

8. Which one of the following topics is not addressed in the rules and regulations of the amateur service? [2A-3.2]
A. Station operation standards
B. Technical standards
C. Providing emergency communications
D. Station construction standards

9. What is the definition of an amateur operator? [2A-4.1]
A. A person who has not received any training in radio operations
B. A person holding a written authorization to be the control operator of an amateur station
C. A person who performs private radio communications for hire
D. A trainee in a commercial radio station

10. What term describes a person holding a written authorization to be the control operator of an amateur station? [2A-4.2]
A. A Citizen Radio operator
B. A Personal Radio operator
C. A Radio Service operator
D. An amateur operator

One (1) question should be from the following:

11. What is the portion of an amateur operator/primary station license that conveys operator privileges? [2A-5.1]
A. The verification section
B. Form 610
C. The operator license
D. The station license

12. What authority is derived from an operator/primary station license? [2A-5.2]
A. The authority to operate any shortwave radio station
B. The authority to be the control operator of an amateur station
C. The authority to have an amateur station at a particular location
D. The authority to transmit on either amateur or Class D citizen's band frequencies

13. What authority is derived from a written authorization for an amateur station? [2A-6.1]
A. The authority to use specified operating frequencies
B. The authority to operate an amateur station
C. The authority to enforce FCC Rules when violations are noted on the part of other operators
D. The authority to transmit on either amateur or Class D citizen's band frequencies

14. What part of your amateur license gives you authority to operate an amateur station? [2A-6.2]
A. The operator license
B. The FCC Form 610
C. The station license
D. An amateur operator/primary station license does not specify a station location

15. What is an amateur station? [2A-7.1]
A. A licensed radio station engaged in broadcasting to the public in a limited and well-defined area
B. A radio station used to further commercial radio interests
C. A private radio service used for personal gain and public service
D. A station in an amateur service consisting of the apparatus necessary for carrying on radio communications

16. Who is a control operator? [2A-8.1]
A. An amateur operator designated by the licensee of a station to be responsible for the transmissions from that station to assure compliance with the FCC rules
B. A person, either licensed or not, who controls the emissions of an amateur station
C. An unlicensed person who is speaking over an amateur station's microphone while a licensed person is present
D. A government official who comes to an amateur station to take control for test purposes

17. If you designate another amateur operator to be responsible for the transmissions from your station, what is the other operator called? [2A-8.2]
A. Auxiliary operator
B. Operations coordinator
C. Third party
D. Control operator

18. List the five United States amateur operator/primary station license classes in order of increasing privileges. [2A-9.1]
A. Novice, General, Technician, Advanced, Amateur Extra
B. Novice, Technician, General, Advanced, Digital
C. Novice, Technician, General, Amateur, Extra
D. Novice, Technician, General, Advanced, Amateur Extra

19. What is the license class immediately above Novice class? [2A-9.3]
A. The Digital class license
B. The Technician class license
C. The General class license
D. The Experimenter's class license

One (1) question should be from the following:

20. What frequencies are available in the amateur 40-meter wavelength band for a control operator holding a Novice class operator license in ITU Region 2? [2A-10.2]
A. 3500 to 4000 kHz
B. 3700 to 3750 kHz
C. 7100 to 7150 kHz
D. 7000 to 7300 kHz

21. What frequencies are available in the amateur 15-meter wavelength band for a control operator holding a Novice class operator license? [2A-10.3]
A. 21.100 to 21.200 MHz
B. 21.000 to 21.450 MHz
C. 28.000 to 29.700 MHz
D. 28.100 to 28.200 MHz

22. What frequencies are available in the amateur 10-meter wavelength band for a control operator holding a Novice class operator license? [2A-10.4]
A. 28.000 to 29.700 MHz
B. 28.100 to 28.300 MHz
C. 28.100 to 28.500 MHz
D. 28.300 to 28.500 MHz

23. What frequencies are available in the amateur 220-MHz band for a control operator holding a Novice class operator license in ITU Region 2? [2A-10.5]
A. 225.0 to 230.5 MHz
B. 222.1 to 223.91 MHz
C. 224.1 to 225.1 MHz
D. 222.2 to 224.0 MHz

24. What frequencies are available in the amateur 1270-MHz band for a control operator holding a Novice class operator license? [2A-10.6]
A. 1260 to 1270 MHz
B. 1240 to 1300 MHz
C. 1270 to 1295 MHz
D. 1240 to 1246 MHz

25. If you are operating your amateur station on 3725 kHz, in what meter band are you operating? [2A-10.7]
A. 80 meters
B. 40 meters
C. 15 meters
D. 10 meters

26. If you are operating your amateur station on 7125 kHz, in what meter band are you operating? [2A-10.8]
A. 80 meters
B. 40 meters
C. 15 meters
D. 10 meters

27. If you are operating your amateur station on 21150 kHz, in what meter band are you operating? [2A-10.9]
A. 80 meters
B. 40 meters
C. 15 meters
D. 10 meters

28. If you are operating your amateur station on 28150 kHz, in what meter band are you operating? [2A-10.10]
A. 80 meters
B. 40 meters
C. 15 meters
D. 10 meters

One (1) question should be from the following:

29. Who is eligible to obtain a US amateur operator/primary station license? [2A-11.1]
A. Anyone except a representative of a foreign government
B. Only a citizen of the United States
C. Anyone
D. Anyone except an employee of the United States Government

30. Who is not eligible to obtain a US amateur operator/primary station license? [2A-11.2]
A. Any citizen of a country other than the United States
B. A representative of a foreign government
C. No one
D. An employee of the United States Government

31. What FCC examination elements are required for a Novice class license? [2A-12.1]
A. Elements 1(A) and 2(A)
B. Elements 1(A) and 3(A)
C. Elements 1(A) and 2
D. Elements 2 and 4

32. What is an FCC Element 1(A) examination intended to prove? [2A-12.2]
A. The applicant's ability to send and receive texts in the international Morse code at not less than 5 words per minute
B. The applicant's ability to send and receive texts in the international Morse code at not less than 13 words per minute
C. The applicant's knowledge of Novice class theory and regulations
D. The applicant's ability to recognize Novice frequency assignments and operating modes

33. What is an FCC Element 2 examination? [2A-12.3]
A. A test of the applicant's ability to send and receive Morse code at 5 words per minute
B. The written examination concerning the privileges of a Technician class operator license
C. A test of the applicant's ability to recognize Novice frequency assignments
D. The written examination concerning the privileges of a Novice class operator license

34. Who is eligible to obtain an FCC-issued written authorization for an amateur station? [2A-13.1]
A. A licensed amateur operator
B. Any unlicensed person, except an agent of a foreign government
C. Any unlicensed person, except an employee of the United States Government
D. Any unlicensed United States Citizen

35. Why is an amateur operator required to furnish the FCC with a current mailing address served by the US Postal service? [2A-14.1]
A. So the FCC has a record of the location of each amateur station
B. In order to comply with the Commission's rules and so the FCC can correspond with the licensee
C. So the FCC can send license-renewal notices
D. So the FCC can compile a list for use in a call sign directory

36. Which one of the following call signs is a valid US amateur call? [2A-15.1]
A. UA4HAK
B. KBL7766
C. KA9OLS
D. BY7HY

37. Which one of the following call signs is a valid US amateur call? [2A-15.2]
A. CE2FTF
B. G3GVA
C. UA1ZAM
D. AA2Z

38. Which one of the following call signs is not a valid US amateur call? [2A-15.3]
A. KDV5653
B. WA1DVU
C. KA5BUG
D. NT0Z

39. What letters may be used for the first letter in a valid US amateur call sign? [2A-15.4]
A. K, N, U and W
B. A, K, N and W
C. A, B, C and D
D. A, N, V and W

40. Excluding special-event call signs that may be issued by the FCC, what numbers may be used in a valid US call sign? [2A-15.5]
A. Any double-digit number, 10 through 99
B. Any double-digit number, 22 through 45
C. Any single digit, 1 though 9
D. A single digit, 0 through 9

41. Your Novice license was issued on November 1, 1988. When will it expire? [2A-16.1]
A. On the date specified on the license
B. November 30, 1998
C. November 1, 1993
D. November 1, 1990

One (1) question should be from the following:

42. What does the term emission mean? [2A-17.1]
A. RF signals transmitted from a radio station
B. Signals refracted by the E layer
C. Filter out the carrier of a received signal
D. Baud rate

43. What emission types are Novice control operators permitted to use on the 80-meter wavelength band? [2A-17.2]
A. CW only
B. Data only
C. RTTY only
D. Phone only

44. What emission types are Novice control operators permitted to use in the 40-meter wavelength band? [2A-17.3]
A. CW only
B. Data only
C. RTTY only
D. Phone only

45. What emission types are Novice control operators permitted to use in the 15-meter wavelength band? [2A-17.4]
A. CW only
B. Data only
C. RTTY only
D. Phone only

46. What emission types are Novice control operators permitted to use from 7100 to 7150 kHz in ITU Region 2? [2A-17.6]
A. CW and data
B. Phone
C. All amateur emission privileges authorized for use on those frequencies
D. CW only

47. What emission types are Novice control operators permitted to use on frequencies from 21.1 to 21.2 MHz? [2A-17.7]
A. CW and data only
B. CW and phone only
C. All amateur emission privileges authorized for use on those frequencies
D. CW only

48. What emission types are Novice control operators permitted to use on frequencies from 28.1 to 28.3 MHz? [2A-17.8]
A. All authorized amateur emission privileges
B. Data or phone only
C. CW, RTTY and data
D. CW and phone only

49. What emission types are Novice control operators permitted to use on frequencies from 28.3 to 28.5 MHz? [2A-17.9]
A. All authorized amateur emission privileges
B. CW and data only
C. CW and single-sideband phone only
D. Data and phone only

50. What emission types are Novice control operators permitted to use on the amateur 220-MHz band in ITU Region 2? [2A-17.10]
A. CW and phone only
B. CW and data only
C. Data and phone only
D. All amateur emission privileges authorized for use on 220 MHz

51. What emission types are Novice control operators permitted to use on the amateur 1270-MHz band? [2A-17.11]
A. Data and phone only
B. CW and data only
C. CW and phone only
D. All amateur emission privileges authorized for use on 1270 MHz

52. On what frequencies in the 10-meter wavelength band may a Novice control operator use single-sideband phone? [2A-17.12]
A. 3700 to 3750 kHz
B. 7100 to 7150 kHz
C. 21100 to 21200 kHz
D. 28300 to 28500 kHz

53. On what frequencies in the 1.25-meter wavelength band in ITU Region 2 may a Novice control operator use FM phone emission? [2A-17.13]
A. 28.3 to 28.5 MHz
B. 144.0 to 148.0 MHz
C. 222.1 to 223.91 MHz
D. 1240 to 1270 MHz

One (1) question should be from the following:

54. What amount of output transmitting power may a Novice class control operator use when operating below 30 MHz? [2A-18.1]
A. 200 watts input
B. 250 watts output
C. 1500 watts PEP output
D. The minimum legal power necessary to carry out the desired communications

55. What is the maximum transmitting power ever permitted to be used by an amateur station transmitting in the 80, 40 and 15-meter Novice bands? [2A-18.2]
A. 75 watts PEP output
B. 100 watts PEP output
C. 200 watts PEP output
D. 1500 watts PEP output

56. What is the maximum transmitting power permitted an amateur station transmitting on 3725 kHz? [2A-18.3]
A. 75 watts PEP output
B. 100 watts PEP output
C. 200 watts PEP output
D. 1500 watts PEP output

57. What is the maximum transmitting power permitted an amateur station transmitting on 7125 kHz? [2A-18.4]
A. 75 watts PEP output
B. 100 watts PEP output
C. 200 watts PEP output
D. 1500 watts PEP output

58. What is the maximum transmitting power permitted an amateur station transmitting on 21.125 MHz? [2A-18.5]
A. 75 watts PEP output
B. 100 watts PEP output
C. 200 watts PEP output
D. 1500 watts PEP output

59. What is the maximum transmitting power permitted an amateur station with a Novice control operator transmitting on 28.125 MHz? [2A-19.1]
A. 75 watts PEP output
B. 100 watts PEP output
C. 200 watts PEP output
D. 1500 watts PEP output

60. What is the maximum transmitting power permitted an amateur station with a Novice control operator transmitting in the amateur 10-meter wavelength band? [2A-19.2]
A. 25 watts PEP output
B. 200 watts PEP output
C. 1000 watts PEP output
D. 1500 watts PEP output

61. What is the maximum transmitting power permitted an amateur station with a Novice control operator transmitting in the amateur 220-MHz band? [2A-19.3]
A. 5 watts PEP output
B. 10 watts PEP output
C. 25 watts PEP output
D. 200 watts PEP output

62. What is the maximum transmitting power permitted an amateur station with a Novice control operator transmitting in the amateur 1270-MHz band? [2A-19.4]
A. 5 milliwatts PEP output
B. 500 milliwatts PEP output
C. 1 watt PEP output
D. 5 watts PEP output

63. What amount of transmitting power may an amateur station with a Novice control operator use in the amateur 220-MHz band? [2A-19.5]
A. Not less than 5 watts PEP output
B. The minimum legal power necessary to maintain reliable communications
C. Not more than 50 watts PEP output
D. Not more than 200 watts PEP output

64. What term is used to describe narrow-band direct-printing telegraphy emissions? [2A-20.1]
A. Teleport communications
B. Direct communications
C. RTTY communications
D. Third-party communications

65. What term is used to describe telemetry, telecommand and computer communications emissions? [2A-20.2]
A. Teleport communications
B. Direct communications
C. Data communications
D. Third-party communications

66. On what frequencies in the 10-meter wavelength band are Novice control operators permitted to transmit RTTY? [2A-20.3]
A. 28.1 to 28.5 MHz
B. 28.0 to 29.7 MHz
C. 28.1 to 28.2 MHz
D. 28.1 to 28.3 MHz

One (1) question should be from the following:

67. Who is held responsible for the proper operation of an amateur station? [2A-21.1]
A. Only the control operator
B. Only the station licensee
C. Both the control operator and the station licensee
D. The person who owns the property where the station is located

68. You allow another amateur operator to use your amateur station. What are your responsibilities, as the station licensee? [2A-21.2]
A. You and the other amateur operator are equally responsible for the proper operation of your station
B. Only the control operator is responsible for the proper operation of the station
C. As the station licensee, you must be at the control point of your station whenever it is operated
D. You must notify the FCC when another amateur will be the control operator of your station

69. What is your primary responsibility as the station licensee? [2A-21.3]
A. You must permit any licensed amateur operator to operate your station at any time upon request
B. You must be present whenever the station is operated
C. You must notify the FCC in writing whenever another amateur operator will act as the control operator
D. You are responsible for the proper operation of the station for which you are licensed

70. If you are the licensee of an amateur station when are you not responsible for its proper operation? [2A-21.4]
A. Only when another licensed amateur is the control operator
B. The licensee is responsible for the proper operation of the station for which he or she is licensed
C. Only after notifying the FCC in writing that another licensed amateur will assume responsibility for the proper operation of your station
D. Only when your station is in repeater operation

71. When must an amateur station have a control operator? [2A-22.1]
A. A control operator is only required for training purposes
B. Whenever the station receiver is operated
C. Whenever the station is transmitting
D. A control operator is not required

72. Another amateur gives you permission to use her amateur station. What are your responsibilities, as the control operator? [2A-22.2]
A. Both you and she are equally responsible for the proper operation of her station
B. Only the station licensee is responsible for the proper operation of the station, not you the control operator
C. You must be certain the station licensee has given proper FCC notice that you will be the control operator
D. You must inspect all antennas and related equipment to ensure they are working properly

73. Who may be the control operator of an amateur station? [2A-23.1]
A. Any person over 21 years of age
B. Any properly licensed amateur operator that is designated by the station licensee
C. Any licensed amateur operator with an Advanced class license or higher
D. Any person over 21 years of age with a General class license or higher

74. Where must an amateur operator be when he or she is performing the duties of control operator? [2A-24.1]
A. Anywhere in the same building as the transmitter
B. At the control point of the amateur station
C. At the station entrance, to control entry to the room
D. Within sight of the station monitor, to view the output spectrum of the transmitter

75. Where must you keep your amateur operator license when you are operating a station? [2A-25.1]
A. Your original operator license must always be posted in plain view
B. Your original operator license must always be taped to the inside front cover of your station log
C. You must have the original or a photocopy of your operator license in your possession
D. You must have the original or a photocopy of your operator license posted at your primary station location. You need not have the original license nor a copy in your possession to operate another station

76. Where must you keep your written authorization for an amateur station? [2A-26.1]
A. Your original station license must always be taped to the inside front cover of your station log
B. Your original station license must always be posted in plain view
C. You must post the original or a photocopy of your station license at the main entrance to the transmitter building
D. The original or a photocopy of the written authorization for an amateur station must be retained at the station

One (1) question should be from the following:

77. How often must an amateur station be identified? [2A-27.1]
A. At the beginning of the contact and at least every ten minutes during a contact
B. At least once during each transmission
C. At least every ten minutes during a contact and at the end of the contact
D. Every 15 minutes during a contact and at the end of the contact

78. As an amateur operator, how should you correctly identify your station? [2A-27.2]
A. With the name and location of the control operator
B. With the station call sign
C. With the call of the control operator, even when he or she is visiting another radio amateur's station
D. With the name and location of the station licensee, followed by the two-letter designation of the nearest FCC Field Office

79. What station identification, if any, is required at the beginning of communication? [2A-27.3]
A. The operator originating the contact must transmit both call signs
B. No identification is required at the beginning of the contact
C. Both operators must transmit their own call signs
D. Both operators must transmit both call signs

80. What station identification, if any, is required at the end of a communication? [2A-27.4]
A. Both stations must transmit their own call sign, assuming they are FCC-licensed
B. No identification is required at the end of the contact
C. The station originating the contact must always transmit both call signs
D. Both stations must transmit their own call sign followed by a two-letter designator for the nearest FCC field office

81. What do the FCC rules for amateur station identification generally require? [2A-27.5]
A. Each amateur station shall give its call sign at the beginning of each communication, and every ten minutes or less during a communication
B. Each amateur station shall give its call sign at the end of each communication, and every ten minutes or less during a communication
C. Each amateur station shall give its call sign at the beginning of each communication, and every five minutes or less during a communication
D. Each amateur station shall give its call sign at the end of each communication, and every five minutes or less during a communication

82. What is the fewest number of times you must transmit your amateur station identification during a 25 minute QSO? [2A-27.6]
A. 1
B. 2
C. 3
D. 4

83. What is the longest period of time during a QSO that an amateur station does not need to transmit its station identification? [2A-27.7]
A. 5 minutes
B. 10 minutes
C. 15 minutes
D. 20 minutes

84. With which amateur stations may an FCC-licensed amateur station communicate? [2A-28.1]
A. All amateur stations
B. All public noncommercial radio stations unless prohibited by the station's government
C. Only with US amateur stations
D. All amateur stations, unless prohibited by the amateur's government

85. With which non-amateur stations may an FCC-licensed amateur station communicate? [2A-28.2]
A. No non-amateur stations
B. All such stations
C. Only those authorized by the FCC
D. Only those who use the International Morse code

86. When must the licensee of an amateur station in portable or mobile operation notify the FCC? [2A-29.1]
A. One week in advance if the operation will last for more than 24 hours
B. FCC notification is not required for portable or mobile operation
C. One week in advance if the operation will last for more than a week
D. One month in advance of any portable or mobile operation

87. When may you operate your amateur station at a location within the United States, its territories or possessions other than the one listed on your station license? [2A-29.2]
A. Only during times of emergency
B. Only after giving proper notice to the FCC
C. During an emergency or an FCC-approved emergency preparedness drill
D. Whenever you want to

88. When are communications pertaining to the business or commercial affairs of any party permitted in the amateur service? [2A-30.1]
A. Only when the immediate safety of human life or immediate protection of property is threatened
B. There are no rules against conducting business communications in the amateur service
C. No business communications of any kind are ever permitted in the amateur service
D. Business communications are permitted between the hours of 9 AM to 5 PM, only on weekdays

89. You wish to obtain an application for membership in the American Radio Relay League. When would you be permitted to send an Amateur Radio message requesting the application? [2A-30.2]
A. At any time, since the ARRL is a not-for-profit organization
B. Never. This would facilitate the commercial affairs of the ARRL
C. Only during normal business hours, between 9 AM and 5 PM
D. At any time, since there are no rules against conducting business communications in the amateur service

90. On your way home from work you decide to order pizza for dinner. When would you be permitted to use the autopatch on your radio club repeater to order the pizza? [2A-30.3]
A. At any time, since you will not profit from the communications
B. Only during normal business hours, between 9 AM and 5 PM
C. At any time, since there are no rules against conducting business communications in the amateur service
D. Never. This would facilitate the commercial affairs of a business

One (1) question should be from the following:

91. When may an FCC-licensed amateur operator communicate with an amateur operator in a foreign country? [2A-31.1]
A. Only when the foreign operator uses English as his primary language
B. All the time, except on 28.600 to 29.700 MHz
C. Only when a third party agreement exists between the US and the foreign country
D. At any time unless prohibited by either the US or the foreign government

92. When may an amateur station be used to transmit messages for hire? [2A-32.1]
A. Under no circumstances may an amateur station be hired to transmit messages
B. Modest payment from a non-profit charitable organization is permissible
C. No money may change hands, but a radio amateur may be compensated for services rendered with gifts of equipment or services rendered as a returned favor
D. All payments received in return for transmitting messages by amateur radio must be reported to the IRS

93. When may the control operator be paid to transmit messages from an amateur station? [2A-32.2]
A. The control operator may be paid if he or she works for a public service agency such as the Red Cross
B. The control operator may not be paid under any circumstances
C. The control operator may be paid if he or she reports all income earned from operating an amateur station to the IRS as receipt of tax-deductible contributions
D. The control operator may accept compensation if he or she works for a club station during the period in which the station is transmitting telegraphy practice or information bulletins if certain exacting conditions are met

94. When is an amateur operator permitted to broadcast information intended for the general public? [2A-33.1]
A. Amateur operators are not permitted to broadcast information intended for the general public
B. Only when the operator is being paid to transmit the information
C. Only when such transmissions last less than 1 hour in any 24-hour period
D. Only when such transmissions last longer than 15 minutes

95. What is third-party communications? [2A-34.1]
A. A message passed from the control operator of an amateur station to another control operator on behalf of another person
B. Public service communications handled on behalf of a minor political party
C. Only messages that are formally handled through amateur radio channels
D. A report of highway conditions transmitted over a local repeater

96. Who is a third party in amateur communications? [2A-34.2]
A. The amateur station that breaks into a two-way contact between two other amateur stations
B. Any person for whom a message is passed through amateur communication channels other than the control operators of the two stations handling the message
C. A shortwave listener monitoring a two-way amateur communication
D. The control operator present when an unlicensed person communicates over an amateur station

97. When is an amateur operator permitted to transmit a message to a foreign country for a third party? [2A-34.3]
A. Anytime
B. Never
C. Anytime, unless there is a third-party communications agreement between the US and the foreign government
D. When there is a third-party communications agreement between the US and the foreign government, or when the third party is eligible to be the control operator of the station

98. Is an amateur station permitted to transmit music? [2A-35.1]
A. The transmission of music is not permitted in the amateur service
B. When the music played produces no dissonances or spurious emissions
C. When it is used to jam an illegal transmission
D. Only above 1280 MHz

99. Is the use of codes or ciphers where the intent is to obscure the meaning permitted during a two-way communication in the amateur service? [2A-36.1]
A. Codes and ciphers are permitted during ARRL-sponsored contests
B. Codes and ciphers are permitted during nationally declared emergencies
C. The transmission of codes and ciphers where the intent is to obscure the meaning is not permitted in the amateur service
D. Codes and ciphers are permitted above 1280 MHz

100. When is an operator in the amateur service permitted to use abbreviations that are intended to obscure the meaning of the message? [2A-36.2]
A. Only during ARRL-sponsored contests
B. Only on frequencies above 222.5 MHz
C. Only during a declared communications emergency
D. Abbreviations that are intended to obscure the meaning of the message may never be used in the amateur service

One (1) question should be from the following:

101. Under what circumstances, if any, may the control operator cause false or deceptive signals or communications to be transmitted? [2A-37.1]
A. Under no circumstances
B. When operating a beacon transmitter in a "fox hunt" exercise
C. When playing a harmless "practical joke" without causing interference to other stations that are not involved
D. When you need to obscure the meaning of transmitted information to ensure secrecy

102. If an amateur operator transmits the word "MAYDAY" when no actual emergency has occurred, what is this called? [2A-37.2]
A. A traditional greeting in May
B. An Emergency Action System test transmission
C. False or deceptive signals
D. "MAYDAY" has no significance in an emergency situation

103. When may an amateur station transmit unidentified communications? [2A-38.1]
A. A transmission need not be identified if it is restricted to brief tests not intended for reception by other parties
B. A transmission need not be identified when conducted on a clear frequency or "dead band" where interference will not occur
C. An amateur operator may never transmit unidentified communications
D. A transmission need not be identified unless two-way communications or third-party communications handling are involved

104. What is the meaning of the term unidentified radio communications or signals? [2A-38.2]
A. Radio communications in which the transmitting station's call sign is transmitted in modes other than CW and voice
B. Radio communications approaching a receiving station from an unknown direction
C. Radio communications in which the operator fails to transmit his or her name and QTH
D. Radio communications in which the station identification is not transmitted

105. What is the term used to describe a transmission from an amateur station that does not transmit the required station identification? [2A-38.3]
A. Unidentified communications or signals
B. Reluctance modulation
C. N0N emission
D. Tactical communication

106. When may an amateur operator willfully or maliciously interfere with a radio communication or signal? [2A-39.1]
A. You may jam another person's transmissions if that person is not operating in a legal manner
B. You may interfere with another station's signals if that station begins transmitting on a frequency already occupied by your station
C. You may never willfully or maliciously interfere with another station's transmissions
D. You may expect, and cause, deliberate interference because it is unavoidable during crowded band conditions

107. What is the meaning of the term malicious interference? [2A-39.2]
A. Accidental interference
B. Intentional interference
C. Mild interference
D. Occasional interference

108. What is the term used to describe an amateur radio transmission that is intended to disrupt other communications in progress? [2A-39.3]
A. Interrupted CW
B. Malicious interference
C. Transponded signals
D. Unidentified transmissions

109. As an amateur operator, you receive an Official Notice of Violation from the FCC. How promptly must you respond? [2A-40.1]
A. Within 90 days
B. Within 30 days
C. As specified in the Notice
D. The next day

110. If you were to receive a voice distress signal from a station on a frequency outside your operator privileges, what restrictions would apply to assisting the station in distress? [2A-40.2]
A. You would not be allowed to assist the station because the frequency of its signals were outside your operator privileges
B. You would be allowed to assist the station only if your signals were restricted to the nearest frequency band of your privileges
C. You would be allowed to assist the station on a frequency outside of your operator privileges only if you used international Morse code
D. You would be allowed to assist the station on a frequency outside of your operator privileges using any means of radio communications at your disposal

111. If you were in a situation where normal communication systems were disrupted due to a disaster, what restrictions would apply to essential communications you might provide in connection with the immediate safety of human life? [2A-40.3]
A. You would not be allowed to communicate at all except to the FCC Engineer in Charge of the area concerned
B. You would be restricted to communications using only the emissions and frequencies authorized to your operator privileges
C. You would be allowed to communicate on frequencies outside your operator privileges only if you used international Morse code
D. You would be allowed to use any means of radio communication at your disposal

SUBELEMENT 2B - Operating Procedures (2 Questions)

One (1) question should be from the following:

112. What is the most important factor to consider when selecting a transmitting frequency within your authorized subband? [2B-1-1.1]
A. The frequency should not be in use by other amateurs
B. You should be able to hear other stations on the frequency to ensure that someone will be able to hear you
C. Your antenna should be resonant at the selected frequency
D. You should ensure that the SWR on the antenna feed line is high enough at the selected frequency

113. You wish to contact an amateur station more than 1500 miles away on a summer afternoon. Which band is most likely to provide a successful contact? [2B-1-1.2]
A. The 80- or 40-meter wavelength bands
B. The 40- or 15-meter wavelength bands
C. The 15- or 10-meter wavelength bands
D. The 1-1/4 meter or 23-centimeter wavelength bands

114. How can on-the-air transmitter tune-up be kept as short as possible? [2B-1-1.3]
A. By using a random wire antenna
B. By tuning up on 40 meters first, then switching to the desired band
C. By tuning the transmitter into a dummy load
D. By using twin lead instead of coaxial-cable feed lines

115. You are having a QSO with your uncle in Pittsburgh when you hear an emergency call for help on the frequency you are using. What should you do? [2B-1-2.1]
A. Inform the station that the frequency is in use
B. Direct the station to the nearest emergency net frequency
C. Call your local Civil Preparedness Office and inform them of the emergency
D. Immediately stand by to copy the emergency communication

116. What is the format of a standard Morse code CQ call? [2B-2-1.1]
A. Transmit the procedural signal "CQ" three times, followed by the procedural signal "DE", followed by your call three times
B. Transmit the procedural signal "CQ" three times, followed by the procedural signal "DE", followed by your call one time
C. Transmit the procedural signal "CQ" ten times, followed by the procedural signal "DE", followed by your call one time
D. Transmit the procedural signal "CQ" continuously until someone answers your call

117. How should you answer a Morse code CQ call? [2B-2-1.2]
A. Send your call sign four times
B. Send the other station's call sign twice, followed by the procedural signal "DE", followed by your call sign twice
C. Send the other station's call sign once, followed by the procedural signal "DE", followed by your call sign four times
D. Send your call sign followed by your name, station location and a signal report

118. At what telegraphy speed should a "CQ" message be transmitted? [2B-2-2.1]
A. Only speeds below five WPM
B. The highest speed your keyer will operate
C. Any speed at which you can reliably receive
D. The highest speed at which you can control the keyer

119. What is the meaning of the Morse code character AR? [2B-2-3.1]
A. Only the called station transmit
B. All received correctly
C. End of transmission
D. Best regards

120. What is the meaning of the Morse code character SK? [2B-2-3.2]
A. Received some correctly
B. Best regards
C. Wait
D. End of contact

121. What is the meaning of the Morse code character BT? [2B-2-3.3]
A. Double dash "="
B. Fraction bar "/"
C. End of contact
D. Back to you

122. What is the meaning of the Morse code character DN? [2B-2-3.4]
A. Double dash "="
B. Fraction bar "/"
C. Done now (end of contact)
D. Called station only transmit

123. What is the meaning of the Morse code character KN? [2B-2-3.5]
A. Fraction bar "/"
B. End of contact
C. Called station only transmit
D. Key now (go ahead to transmit)

124. What is the procedural signal "CQ" used for? [2B-2-4.1]
A. To notify another station that you will call on the quarter hour
B. To indicate that you are testing a new antenna and are not listening for another station to answer
C. To indicate that only the called station should transmit
D. A general call when you are trying to make a contact

125. What is the procedural signal "DE" used for? [2B-2-4.2]
A. To mean "from" or "this is," as in "W9NGT de N9BTT"
B. To indicate directional emissions from your antenna
C. To indicate "received all correctly"
D. To mean "calling any station"

126. What is the procedural signal "K" used for? [2B-2-4.3]
A. To mean "any station transmit"
B. To mean "all received correctly"
C. To mean "end of message"
D. To mean "called station only transmit"

127. What does the R in the RST signal report mean? [2B-2-5.1]
A. The recovery of the signal
B. The resonance of the CW tone
C. The rate of signal flutter
D. The readability of the signal

128. What does the S in the RST signal report mean? [2B-2-5.2]
A. The scintillation of a signal
B. The strength of the signal
C. The signal quality
D. The speed of the CW transmission

129. What does the T in the RST signal report mean? [2B-2-5.3]
A. The tone of the signal
B. The closeness of the signal to "telephone" quality
C. The timing of the signal dot to dash ratio
D. The tempo of the signal

130. What is one meaning of the Q signal "QRS"? [2B-2-6.1]
A. Interference from static
B. Send more slowly
C. Send RST report
D. Radio station location is

131. What is one meaning of the Q signal "QRT"? [2B-2-6.2]
A. The correct time is
B. Send RST report
C. Stop sending
D. Send more slowly

132. What is one meaning of the Q signal "QTH"? [2B-2-6.3]
A. Time here is
B. My name is
C. Stop sending
D. My location is ...

133. What is one meaning of the Q signal "QRZ," when it is followed with a question mark? [2B-2-6.4]
A. Who is calling me?
B. What is your radio zone?
C. What time zone are you in?
D. Is this frequency in use?

134. What is one meaning of the Q signal "QSL," when it is followed with a question mark? [2B-2-6.5]
A. Shall I send you my log?
B. Can you acknowledge receipt (of my message)?
C. Shall I send more slowly?
D. Who is calling me?

135. What is the format of a standard radiotelephone CQ call? [2B-3-1.1]
A. Transmit the phrase "CQ" at least ten times, followed by "this is," followed by your call sign at least two times
B. Transmit the phrase "CQ" at least five times, followed by "this is," followed by your call sign once
C. Transmit the phrase "CQ" three times, followed by "this is," followed by your call sign three times
D. Transmit the phrase "CQ" at least ten times, followed by "this is," followed by your call sign once